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CHYLOUS ASCITES.

BY

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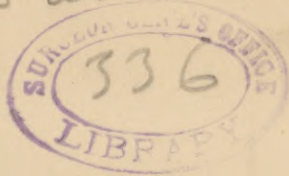
My attention was first attracted to diseases of the lymphatics years ago, when Dr. S. C. Busey, of this city, was preparing for publication a series of articles upon "Occlusion and Dilatation of the Lymphatic Channels," and from that time I have in spare moments endeavored to trace the important rôle played by the lymphatic system in the human organism.

That it is to a certain extent a safety-valve against disease is apparent from the frequent suppuration of lymphatic glands under the influence of infectious poisons, and the consequent elimination by them of septic poison before the system at large becomes subjected to its baneful influence and the destruction necessarily following.

I shall endeavor in this paper to show how easy it is to mistake the character of fluid accumulations in the abdominal cavity before tapping or making an exploratory incision, and to guard against mistakes by giving the literature of the subject, as far as it can be obtained, and such deductions as seem warranted thereby.

In this connection it will be pardonable, I hope, to reproduce here the history of an interesting case of Chylous Ascites, a brief recital of which was given to the profession through the Medical Society of the District of Columbia, November 24, 1886. When this patient first came under my observation she presented most of the symptoms characteristic of ovarian dropsy. Loss of flesh, that peculiar pinched expression of countenance said to accompany this disease, resonance on percussion in either flank, bulg-

presented by the author



ing of a tumor on right side, fluctuation well marked, with a wave of fluid rather limpid for a multilocular cyst, yet pointing to fluid of a circumscribed peritonitis, or of a cyst of the broad ligament.

Upon consultation, it was determined best to try an exploratory incision, with a view of establishing a correct diagnosis, and this course was pursued. There were present Dr. James E. Morgan, of the consulting staff; Dr. Handy, former Resident Assistant; and Drs. Bovee and Sweetman.

The following is the full history of the case, to which I have appended the histories of about thirty other cases, and such conclusions as are warranted by them:

Maggie M.; æt. 19 years; white; single; nativity, District of Columbia; was admitted to Columbia Hospital for Women November 7, 1886, with the following history:

Puberty at 16 years. Menses regular, painful, scanty, light in color and lasting three days. Father died of phthisis pulmonalis five years ago, and a sister died of the same disease one year later. Two sisters died of diphtheria, and one of heart trouble from rheumatism. Family history otherwise healthy.

Last summer she was a chambermaid at a hotel in the Catskills and had to work very hard. While there she went frequently to balls, sometimes walking as far as ten miles, being perfectly exhausted next day.

She now suffers from "swelling" of the abdomen, which "began" about three months ago, after an attack of "chills." When the swelling was observed she had a severe pain in the right inguinal region, which lasted about a week. Since that time she has had no pain. Is constipated; appetite poor; has dyspepsia; is pale, emaciated and very nervous; has never been strong. Last menses November 1 to 4, 1886.

Examination.—Breasts normal in appearance; abdomen symmetrically enlarged by a tumor extending from pubes to ensiform cartilage. Fluctuation through

the extremely tense abdominal walls very distinct. From the combined symptoms and examination a supposed cyst of the broad ligament was diagnosed. Five inches above umbilicus the circumference of the body is $29\frac{1}{2}$ inches; at umbilicus $34\frac{1}{2}$ inches and four inches lower is $32\frac{1}{2}$ inches.

Urine.—Color, pale straw; specific gravity, 1.012; no trace of albumen; no sugar. Nothing abnormal found by microscopic examination.

November 13.—An exploratory incision in median line was made. The peritoneum was found thickened and as soon as it was nicked a creamy colored fluid gushed out. The patient was turned on her side and the fluid allowed to escape. While it was flowing rapidly from her the end of a rubber tube was introduced into abdominal opening and nine pints of the fluid were run through the tube into bottles and saved for examination. It was estimated that fully twice as much escaped as was saved. After the fluid had ceased to run, and no more would exude by pressure on the abdominal walls below the opening (the patient still being on her side), she was again placed in the supine position. One index finger was introduced into the abdominal cavity, and felt nothing abnormal in that portion of the body. The other index finger was introduced into the vagina. The ovaries and their appendages, as also the whole pelvic viscera, were found to be normal to the sense of touch.

No enlarged glands were felt nor was any sac found. The only abnormal condition found was the thickened condition of the peritoneum. A glass (Thomas') drainage tube was introduced and cavity was washed out with a 2 per cent. solution of carbolic acid. Some oozing of the creamy fluid continued two or three days. Except an occasional attack of diarrhoea she made an uninterrupted recovery.

December 8.—The abdominal wound is entirely healed. Discharged from hospital.

The next day after the operation the fluid removed from the abdomen was carefully examined with the following result:

Color.—Fresh cream (slightly pinkish from blood).

Reaction.—Alkaline.

Specific Gravity.—1.023.

Albumen.—About 70 per cent. by bulk after heating.

Microscope.—A number of white and red blood corpuscles and a large number of irregularly outlined globular bodies, having a diameter from 8 to 20 micro-millimeters, that are thought to be lymph globules, were found. On standing the fluid separates into distinct layers, the lowest being nearly white.

The patient was subsequently visited twice at her home. The second time, January 18, 1887, she said she had continued to gain flesh and strength and has had no pain; has gained fourteen pounds since leaving hospital; has no enlargement of abdomen, and pronounces herself in "splendid health."

March 2, 1887.—Patient visited the hospital and gave the following report of herself: Appetite good; bowels regular; weight just previous to operation 108 pounds; present weight 123 pounds; last menses February 15. Never felt better in her life. An examination of abdomen revealed no evidence of a reaccumulation of fluid.

This case was reported to the Medical Society of the District of Columbia, November 24, 1886, and a bottle of the fluid was referred to its microscopical committee for examination.

December 1.—The committee made the following report:

"The examination of fluid presented by Dr. P. J. Murphy, November 24, shows numerous large cells (some granular, others fatty) resembling the colostrum corpuscle of milk. On drying these leave fatty acid crystals, many small fat globules and granular cells about the size of white blood corpuscles, a few red blood corpuscles and much free granular matter. The fluid is probably chyle.

D. S. LAMB.

G. N. ACKER."

November 30, 1887.—The patient again visited the hospital. She had been at the same kind of work during the past summer and at the same place as last year. She says she "is in splendid health" (and her appearance corroborates her statement), that she "weighs 130 pounds and menstruates regularly."

In the discussion that followed the report of my case before the Medical Society of the District of Columbia Dr. Busey said the specimen just exhibited by Dr. Murphy was one of the most interesting he had ever seen. The case was one of Chylous Ascites, and it was possible that the chyle had escaped through a puncture of some chyle vessel by the *filaria sanguinis hominis*. Some of the distinctive characteristics of chyle were, however, not present, certainly not given. If the fluid be chyle it must have been discharged from some chyloferous vessel, or escaped by transudation. In the latter event the quantity would have been small and would have gradually diminished instead of continually increasing, as in case of rupture of some chyle-conveying vessels. About thirty cases of Chylous Ascites have been reported. Most of the cases have occurred in Germany. America and England report a few cases.¹

There have been also a few cases of chylous hydrocele reported. The first in this country was by Dr. Mastin, of Mobile, Alabama. Vidal was the first to suggest, but Mastin was the first to demonstrate, that the milky fluid found in these cases had escaped from dilated and ruptured lymph vessels. Having discovered the milky fluid previously by tapping the scrotum, he subsequently, after its refilling, cut down upon the sac and discovered the network of dilated and ruptured lymph vessels, ligated it, and the patient recovered. Mastin, jr., had had a similar case, in which he found the same condition. It was treated in like manner, and also recovered. Other cases had been reported cured, one by the injection of iodine.

Lymph scrotum and chyluria are now believed to be due to the presence of the *filaria*, but as yet only two or three cases of Chylous Ascites have been proven to be due

¹ Holmes's System of Surgery, by Packard, Vol. II, p. 459.

to the puncture of this parasite. The escape of chyle into the peritoneal cavity in large quantities is due to the rupture of some large vessel, thoracic duct, lacteals or receptaculum chyli. Most frequently the rupture is found in the lacteals. Any condition which may interrupt or impede the flow of chyle into the subclavian vein will cause stasis, repletion, dilatation, and may cause rupture either of the duct, or more frequently of the receptaculum or lacteals. Certain pulmonary and heart diseases have produced such results. The presence of cancerous, aneurismal, and other tumors, and other conditions, by occluding or obliterating the thoracic duct either at or about its terminus or along its continuity, have caused rupture of the duct or other large chyle-conveying vessels. Several cases have been ascribed to some violent and sudden effort, and at least one to congenital defect.

The diagnosis of Chylous Acites can only be made by microscopic examination of the fluid. The accumulation of a fluid can be recognized and it can be determined whether free in the peritoneal cavity or in a cyst. Acute anæmia, with great and sudden prostration, a loss of appetite, and rapid diminution of the quantity of urine, associated with a rapid accumulation of a fluid in the peritoneal cavity, might suggest the presence of chyle.

Dr. Busey believed the treatment in this case was correct, but the fluid would probably reaccumulate, and the patient finally, as is usual, die of pulmonary disease. The fluid in Chylous Ascites is chyle, but in the cases of chylous hydrocele it was lymph transformed into a milky or chyle-like fluid in consequence of disease of the *intima* of the lymph vessels.

MEETING DECEMBER 8.

The President in the chair.

The case of Chylous Ascites, reported two weeks previously, came up for continued discussion.

Dr. Busey said that he had recently seen the case, and could add some points to the history. The girl had begun menstruating at 16, and the menses had always been normal except that on one occasion she had "missed" one

month. She had been otherwise healthy, and last summer she had been a chambermaid in a summer hotel in the mountains. She had been accustomed when off duty at night, to take long walks and to go to parties at a distance and dance. It was after one of these long walks that she suddenly felt a violent pain in her abdomen, on the right side. Her abdomen then began to swell, the pain still continuing. She had a good appetite and eat heartily, but lost flesh, color and strength. Since the operation by Dr. Murphy the pain has disappeared, and she has regained somewhat her weight and strength. Before the lower end of the wound, which had been a large one, had closed, there had been some oozing of a chylous fluid. He said it looked as if some chyle duct had been ruptured by violence. Dr. Nickerson, of Lowell, reports such a case in a man upon whom he had operated several times before he obtained a cure. Another case is reported by Winiwarter in a child. The large abdomen was supposed at first to be due to a congenital cyst. Several other cases have been reported, notably one by Monro, in a girl, due to exertion in raising a burden.

Dr. Busey replied to Dr. King that he thought the cause of pain was the rupture of the duct, or receptaculum chyli and to Dr. Cook that there was no special desire on the part of patients suffering from escape of chyle for fat. If the chyle escaped only slowly through a small opening the peritoneum readily absorbs it, and patient suffers no very great emaciation. In cases where there has been a large and sudden escape of chyle there is much loss of weight and symptoms of collapse. The person is probably here also kept alive by reabsorption by the peritoneum. There is a case reported by Poncy which he tapped twenty-two times in six months, removing 285 liters of chyle. In this case the color and smell of foods given could be recognized. Usually there is a good appetite and the food is enjoyed.

FRANKLIN NICKERSON, M. D.

Dr. Nickerson read at the annual meeting of the Mass. Med. Society, June 11, 1884, a paper founded on a case

of chylous deposit in the abdomen. (Boston M. & S. J., 1884, CXI, 152-4; also medical communication to Mass. Med. Soc., 1884, XIII, 279-87.)

His patient, a man, 55 years; small, weighing usually about 105 pounds; usually doing comparatively heavy work; appearance, generally good, spare, well formed, except abdomen large; hair white since 17. Father died of phthisis. Been near-sighted many years; has two healthy children; always been nervous; never had but one testicle; worked hard until January 15, 1877, when he was forced to stop by sudden and severe pains shooting from lower part of back directly through abdomen; vomiting occurred and pain became worse.

Next day Doctors Savory and Fisk found tumor that they called distended bladder, and failed to relieve by catheter, getting but a few drops of limpid urine. Aspiration two quarts milky fluid—relieved; tumor collapsed; two days later again at work; is as well as ever. Was later tapped at respectively 2, 9 and 18 months; pain occurring each time just before tumor appeared, the quantity of fluid lessening at each tapping, and being but 20 ounces at last tapping. Throughout this attack there was no febrile action and no symptom pointing to any organ.

It later partially refilled, but retroceded (according to patient). During six years following first tapping January 15, 1877, he had dull, aching pain in lower part of back aggravated by long walks and riding. Has also had occasionally vomiting of milky looking fluid which, if profuse, is followed by weakness. Last attack of vomiting March, 1883, was accompanied by loose, milky diarrhoea. Since then has been well in every way.

Examination of Fluid—First Tapping.—

General appearance of milk: on standing a few hours a soft and generally diffuse coagulum. Same fluid after a week's exposure in his office to temperature of 60 to 68 degrees Fahr. showed no signs of decomposition. Odorless, mawkish taste; alkaline; specific gravity, 1.018; ether extracted from it largely clear, yellow fluid in which, on addition of nitric acid, an albuminoid precipitate was thrown down.

Microscope.—Large quantities of molecular granules, fat globules, cholesterine, granular corpuscles.

DR. KIEN.

Dr. Kien communicated to the Société de Médecine de Strasburg (see quelques particularités, plus ou moins importantes, qui peuvent accompagner ou suivre l'opération de la paracentèse abdominale. Mem. Soc. de Méd. de Strasburg (1881-2), 1883, XIX, pt. 2, 52-57) the report of an interesting case of Chylous Ascites that was later translated, and appeared in Jour. Am. Med. Assoc. 1883, I, 120.

The subject of this case was an old maid of 50 years. She was suffering from distension of abdomen by a large tumor. In the course of four months she was relieved eight separate times by drawing off each time four gallons of milky fluid that was believed by Prof. Recklinghausen, who examined it, to be chyle. He (Recklinghausen) thought it came from ruptured lacteals of intestines or mesentery. No lesion was found in the abdominal viscera.

DR. PELLETIER.

Dr. Pelletier (Journ. de Med. Chir., Pharm., &c., 1785, LXIII, 496) reports a case of milky fluid being vomited; shortly afterward chylous fluid found in abdominal and pleural cavities and milky diarrhœa; considerable pain in back and lower abdomen. Abdomen very large, and patient meteoric. She was tapped, vomiting again; tapped the second time; very weak, but improved rapidly, and no more fluid was found.

H. MARSHALL HUGHES, M. D.

(A remarkable case of abdominal effusion resulting from a mesenteric tumor, with observations on the effused fluid, by G. Owen Rees, M. D. Guy's Hospital Reports, 1841, VI, 297.)

G. K., 20 years, tall, but well proportioned; florid complexion; long, straight, black hair. Appeared for treatment at Surrey Dispensary December 31, 1840. Appeared to be suffering from functional disease of stomach; appe-

tite poor; occasional pyrosis and vomiting; pain in right side, flatulence and bitter eructations; tongue pale and clean, lateral indentations from teeth; skin clear and soft; pulse feeble, frequent and compressible; expression anxious; not deficient in flesh, but debilitated; palpitation of heart; easily excited; too frequently indulged in sexual pleasures; father died of supposed tropical disease; others of family healthy; patient is wire weaver, and healthy until a year ago; now began to flag a little; indigestion first noticed by family ten months ago; never had abdominal trouble in any manner; January 26, unable to come to dispensary; visited at home; considerable distension of abdomen from intestinal gas; no tumor found, but a little indistinct fluctuation felt; constipated; scanty urine; gave purgative; it acted, and tumor felt.

February 2.—Want of sleep; abdomen tense with fluid; features contracted; face pale and anxious; rapidly emaciating; tonics and stimulants given; no pain; no sickness; diarrhœa; insomnia.

February 4.—Abdomen increased distension; emaciation progressing rapidly; debility increased; urine scanty still.

February 6.—Pain in left hypochondriac region which was tender on pressure; skin soft; tongue clean, pale and moist; pulse very feeble and frequent; blister locally.

February 12.—Pain great from abdominal distension which was extreme in degree (size); nausea; vomiting; urine still scanty; emaciating rapidly.

February 13.—(Edema of legs, with numerous minute, tortuous veins on surface, giving mottled appearance.

February 16.—Diarrhœa; conjunctivitis from entropion, which is produced by rapid absorption of fat of orbit.

February 17.—Died; extremely emaciated; *sectio cadaveris* twenty-two hours after death, by Dr. Nettlefold; heart thin, weak and flabby; no enlargement of bronchial glands discovered. Not a particle of fat found in integument or in omentum; peritoneal cavity contained seven or

eight quarts of rather thick and perfectly milky fluid, aptly compared from appearance to almond emulsion.

Peritoneum non-vascular, except depending portion of ileum, but universally sprinkled with small, white specks, by far the larger portion of which was easily removed by gentle friction, and consisted of delicate and almost capillary shreds, evidently deposited from milky fluid, but some of which was as clearly firmly adherent to, if not produced by, the membrane itself.

They were translucent, angular and elongated rather than rounded, and in external appearance bore a much more striking resemblance to the ova of *pediculi capitis* than to any form of tubercles.

In center of abdomen, resting on spine, was a rounded, nodulated tumor, as large as a twopenny loaf, which consisted of several agglomerated mesenteric glands, some of which were as large as a small orange, and when divided presented a pinkish, soft and pultaceous mass, from which, upon any slight pressure, exuded a white, cream-like fluid which appeared to constitute a portion of the deposit itself. Others were of a dull white color, dryer and more granular, the whole exhibiting, both exteriorly and by exposed section, general appearances of cerebriiform cancer. Other mesenteric glands were more or less enlarged and opaque and of the size of marbles or pigeon eggs. Some of the inguinal glands also considerably enlarged, but contained no heterologue deposit. Several convolutions of small intestines and transverse colon were adherent to the tumor. They all, however, appeared healthy except colon which was in two places contracted and puckered around two white spots as large as a shilling, which were firm and semi-cartilaginous in appearance. Opposite to these spots the mucous membrane was entirely wanting, and their cut surfaces presented the same physical character as early stages of scirrhus of pylorus. One tubercular-looking body only, about the size of a pea, discovered in mesentery, close to a fold of the ileum. Liver, spleen and kidney healthy; pancreas not examined; numerous lacteals, large, tortuous, varicose and distended, some with milky, others with clear fluid were observed in almost all parts

of mesentery. Six ounces fluid sent to Dr. Rees. (Hughes thinks tumor malignant.)

DR. OWEN REES' LETTER.

Fluid contains chyle in considerable quantities, but, owing to general character of serous effusions, the exact amount can not be determined. When fluid agitated with ether, it separates into three distinct parts, the upper being a solution of fatty matter in ether; the lower clear serum; middle, floating mass chylous matter which is analogous to an animal principle existing in large proportion in saliva, and which seems to play some important part in the process of nutrition. Characters of fatty matter dissolved in ether considered in connection with separation of peculiar principle noted, and clearing of serum by ether make it pretty certain that the milkiness is due to chyle. He never saw or heard of such fluid before.

DR. TRUMAN ABELL.

(Letter July 31, 1832, to Editor of Boston M. & S. Jour., 1833, VII, 13.)

REMARKABLE CASE.

Mrs. Reed; 40 years; good general appearance; good health till 1817. While pregnant with twins had small umbilical hernia (from abdominal distension) not larger than an English walnut. This rupture nearly disappeared after delivery. Soon after this noticed tumor in lower part of abdomen, which gradually grew, became painful and greatly impaired her health; it presented solid but rather unequal surfaces, and often caused pains like labor pains, and frequently attended by some vaginal discharge; became anasarcous, making her very large and to appearance very near her end. Breathing became laborious, walking and recumbency difficult; water exuded from skin of legs; punctured and water ran freely for several days. By a few simple medicines water with dropsy disappeared suddenly; now does her house work; abdomen remained distended by original tumor. Absence of water led to discovery of another tumor in

right side, extending from spine of ilium to diaphragm (about 1825-'26). Suffered much. She appealed to doctors to open side and let out fluid. Doctors could not discover fluid in tumor and refused. After 1826 abdomen became worse distended from what was thought to be ascites presenting uniform surface, and distinctness of tumors became less.

As disease progressed, umbilical tumor protruded and eventually formed bag of irregular shape, apex of which was umbilicus being elevated five inches from abdominal surface, and in middle seven or eight inches in circumference, with two lateral processes resembling nipples about one inch long.

The existence of this tumor was known only to herself until after the following occurrence:

Night of July 17, 1832, Dr. A. called in great haste to see her as tumor had burst and was discharging profusely (distance $4\frac{1}{2}$ miles); found her sitting in chair, clothes on and finger on aperture to prevent discharge till doctor came. She said, "She went to bed as usual, and about 12 o'clock was awakened by discharge from a tumor on her bowels, which had burst. Got up and dressed as soon as possible (her daughter assisting) and saved three pints in pot, besides what escaped."

Friction from finger for two hours had enlarged the opening, so that on his ordering her to let it run it would fill a common-sized pot in less than a minute; about 12 pounds drawn while she sat in a chair, and being faint she was placed in bed. After short intervals about 3 pounds more taken. Now too feeble for further evacuation, and remaining 10 pounds drawn next day—being 25 pounds in all.

This fluid discharged through aperture at umbilicus which was at extremity of tumor. But what mystifies is that this fluid was *milk* and without any disagreeable odor more than if taken warm from cow. *Fluid not examined.*

Woman relieved and can walk but the two original tumors (ovarian?) remain, one on each side.

DR. F. W. WEAVER.

CHYLOUS DROPSY.

(London Med. Repos., 1814, II, 377.)

Mr. M., indisposed some time. Disease thought to be connected with liver and given mercurials &c. At length ascites occurred and death soon followed.

Dr. W. sent for after death to tap abdomen previous to placing in coffin. He drew off 16 quarts fluid like milk, inodorous and insipid, some of which he kept many weeks without any appearance of decomposition.

DRS. WILKS AND ORMEROD.

SPECIMEN OF MILKY FLUID OR CHYLOUS FLUID REMOVED FROM ABDOMEN.

(Chemical Analysis of Fluid, by Dr. Marcet, Tr. Path. Soc. London, 1868, XIX, 199.)

Dr. Ormerod, of Brighton, sent specimen of fluid and history of case as follows: A dark, unhealthy-looking man, first seen November 4, 1864; 24 years old, chronic capsular rheumatism of joints of lower extremities and general weakness. Rheumatism ceased by iodide of potash and hot sea baths. Continued to look pale and aged, but no organic disease detected; urine normal; following August relapse from wet and cold in his trade (a hawker), and same treatment restored him.

July, 1867.—Again seen. This time caught cold, not in joints, but in the lower extremities and scrotum, which swelled. Struggled on for some time and came in hospital with congested face, scanty-loaded urine, but no albumen. Abdomen tense with flatus, but contains some fluid, and its small superficial veins generally enlarged.

July 14.—At his request paracentesis performed: 14 pints milky fluid drawn; specific gravity, 1.010. Fluid curdled slightly, and on adding acetic acid effervesced a little.

Microscope.—A few compound granular cells, but chiefly composed of small amorphous particles, scarcely separating on standing.

July 18.—Wound reopened. Free drainage of similar fluid occurred. It coagulates spontaneously into gelatinous masses. No enlargement of any abdominal organ found; undue amount of dullness over right side, and sensation as if a coil of intestines occasionally knocked against anterior abdominal wall.

August 3.—Second tapping; $18\frac{1}{2}$ pints drawn.

Microscope.—Large cells, less granular.

Chemical Examination.—Addition of acetic acid caused thick granular curd to arise to surface. Dark brown on boiling with liquor potassæ. Nitric acid and heat slightly precipitate.

August 16.—Again tapped; 17 pints. Discharge for one or two days followed.

August 22.—Pleurisy and effusion on right side. While this was going on abdomen filled slower.

September 1.—Fourth tapping; $12\frac{1}{2}$ pints. Same.

September 6.—Delirious a few hours; pulse good. After free vomiting of bilious fluid, he suddenly recovered.

September 14.—Quietly left hospital after fifth tapping of 14 pints. Fluid from third tapping now shows crystals of stearic acid.

Examination of Fluid by Dr. Wilks.—Specific gravity, 1.010. No caseine by acids.

Microscope.—Innumerable granules and no distinct oil globules; coagulates by heat and spontaneously on standing.

He reappeared at Brighton Dispensary and was tapped once more; fluid same. Soon after this—November 4, 1867—he died.

Mr. N. P. Blake made post-mortem examination. Emaciation marked; abdomen contains 16 pints milky fluid. Peritoneum rather white and opaque. No growths on its surface. Close to spine behind intestines, extending from liver to promontory of sacrum, and including upper part of right kidney, was a hard white nodulated tumor.

Liver small, thin, thickly studded with masses of a dull white color, from one to three lines in diameter.

Left subclavian vein and its affluent vessels plugged with a light-colored, ragged clot, evidently of long standing. It was softened at center, and at one point was adherent to walls of subclavian vein. The opening of thoracic duct appeared healthy between this clot and opening of the jugular vein.

Behind the innominate artery, pressing on it but not involving its coats, was a white mass about $1\frac{1}{4}$ inches in diameter, just like masses found in abdomen. Mediastinal glands generally healthy. Heart and right lung healthy. Left lung pressed against spine by recent pleural effusion of an opaque yellowish fluid, quite unlike that found in peritoneal cavity. Lungs not examined internally. Some of nodules examined, those of abdomen and chest alike. They were not stained readily by carmine, nor did they change color by iodine. They consisted of imperfectly fibrous structure—the fibers being of mis-shaped cells and amorphous granules, strung in rows with many fat cells. No single cell of characteristic form found anywhere, but field studded over with dark specks appearing on face of section. Under a higher power these were resolved into radiating bundles of crystals, insoluble in acetic acid and unaffected by polarized light. Liver deposit more woolly, contained no fat cells, none of the crystalline fatty deposits, nor any well-developed nucleated cells. It appeared to be of more recent formation.

REPORT OF DR. W. MARCET ON EXAMINATION OF FLUID FROM ABDOMEN.

Fluid is white emulsion, looks like milk; a few white concrete masses at bottom of bottle, which disappear on shaking. On standing undisturbed, fluid separates into two layers, and after less than two days bulk of upper white layer was rather less than half of that of the whole. (Some carbolic acid as preservative must have rendered examination imperfect.) Reaction, alkaline; specific gravity, 1.0125. No coagulum on boiling. Indeed no

change observed. Nitric acid added caused precipitate of dark orange color. Milk (and carbolic acid) gave same result. Experiments suggest caseine present, but not positive. He regards it chyle.

DR. ROKITANSKY.

Rokitansky's case (Path. Anat.; also Ziemssen's *Cycloped.*, vol. 1, 530) was in a woman, sixty-two years old. The thoracic duct was occluded by a peculiar, soapy mass, and partly filled with indurated material. It was completely occluded, and the receptaculum chyli and tributary chyle ducts were dilated and their coats thickened. There was considerable milky effusion into both pleure and into peritoneal cavity. In fact, a general enlargement and dilatation of chyle and lymphatic vessels existed. The above-mentioned soapy mass produced opalescence of water where mixed with it. There was thickening and shortening of mitral valve, with cardiac hypertrophy.

DR. PONCY, JR.

A PARTICULAR DROPSY.

(Saviard's Observations in Surgery, translated by Surgion, p. 247, London, 1740.)

July 2, 1699—Drew fluid from abdomen of a girl who had been attacked with dropsy fifteen months previously. He drew off 13 quarts thick, milky fluid from this time to March 4, 1700—day of her death. He tapped her 22 times drawing off 289 French pints, and as Busey notes, the fluid from abdomen had odor of foods ingested.

Autopsy (a few hours after death in the presence of Du Vernage, Leaulté, and Du Chêne).—The body was lean; abdominal integuments about one-third normal thickness. "The epiploon was so much dissolved that there were only the vestigia of it remaining, at the place of its adhesion to the stomach and pancreas. Upon the surface of the intestines and in their anfractuosités were found a quantity of white creamy filaments, sufficiently compact to bear pulling, and tenacious enough to have a

slender adhesion to the parts. These lacteous concretions were most abundant at the bottom of the abdomen, toward the center of the mesentery, in the hypogastrium and toward the groins." The peritoneal cavity contained about two quarts of a white milky fluid. "The stomach and intestinal canal were so tumefied with wind, and the preternatural bigness of the mesentery raised them so much above the other viscera, that none were preceptible; even the liver, which was deeply lodged under the diaphragma, and so much flattened and extended in bulk that a portion of its small lobe was firmly adherent to the spleen, stomach, and pancreas, and by its gibbous part to the diaphragma, that it could not be separated without tearing, and was of a blackish color." The gall bladder was withered and empty. "Obstructed glands were perceived in the texture of the covering membrane of the liver;" the largest were of the "bigness of peas." The mesenteric glands were enlarged, some as large as the thumb. "The progress of the iliac vessels to the right and left were covered with glandular heaps as large as pullet's eggs; others as large as pigeon's eggs. Upon opening these glands a very white and thick matter was discharged resembling boiled cream."

"From these we proceeded to the examination of the intestinal canal, and began at the pylorus, which was fixed to the liver, spleen, pancreas, mesentery, and epiploon, and even to some circumlocutions of the large and small intestines. We traced it for 10 or 15 inches without finding anything extraordinary, but observed at the beginning of the jejunum a sort of membranous bag covered with creamy filaments, which was full of a white milky liquor.

At the place where the jejunum is fastened to the mesentery, a round fistulous hole existed, through which a probe penetrated an inch into the glandular part, which was very hard and much tumefied. By dilating the fistulous tract the probe was pushed to the diaphragm without injuring any other part. To the right and left of the tract sinuses were found, which seemed "to have been formed in the body of the mesentery, which had become so much enlarged by the obstruction of its glands that it seemed to have degenerated into schirre, and the

matter contained in them resembled that contained in the peritoneum."

"In the thorax, at the point of entrance of the ductus thoracicus, two very large glands were found, containing 'a curdled matter,' and following the course of the duct other glands were observed strung together like beads, and full of the same curdled matter."

DR. H. BALLMANN.

Dr. H. Ballmann reported the following case (in *Centralblatt für die Medicinischen Wissenschaften*, Berlin, 1876, XIV, 275-7):

A woman, 39 years old, was admitted to the clinic on account of ascites. She had menstruated irregularly for some time. She had considerable difficulty arising from accumulation of fluid in the abdomen which increased leading her to seek aid. Finally on account of troubled respiration she was tapped; 8,530 cubic centimeters of milky fluid were removed. This patient, already reduced, died a month later from exhaustion.

Autopsy revealed intestines agglutinated throughout by adhesions, and spaces had been formed on both sides of abdominal cavity by these adhesions. The one on the right side was filled with a serous peritoneal exudation; the left one with a grayish-white fluid, resembling that removed by puncture. Peritoneum closely studded with tubercles, size of hemp kernels. Autopsy gave no explanation regarding the origin and import of the milky transudate. The fluid removed by puncture, which I analyzed might be taken for milk from its appearance. It was bluish in color and so little pellucid that a layer of light one centimeter in thickness could not be distinguished through this fluid at a distance of two meters. Smell indifferent; reaction distinctly alkaline; specific gravity, 1.018½; no cell elements visible under microscope, but only small amorphous bodies which exhibited the Brownian molecular motions; larger fat drops like milk globules were not present. A part of the fluid was shaken with ether. The stratum of ether separated in a

pretty clear yet opalescent layer. The original punctured fluid had been standing two days. There appeared on the surface a thick layer of cream-like consistency and of similar appearance. This creamy surface formed still quicker if the fluid was diluted with double the volume of water.

ANALYSIS OF FLUID.

Every 100 parts of the fluid was composed as follows:

Water	88.2526
Solid bodies.....	11.7474
Albumen.....	6.086
Fats.....	4.231
Cholesterine.....	.0091
Lecithin0096
Inorganic salts.....	1.022
Extract of substances soluble in alcohol.....	.053
Extract of substances soluble in water.....	.169

The transudated fluid was very rich in solids, especially fat; no sugar, no water, and no milk were found. The albumen was serum albumen.

DR. BOSSU.

Bossu (in the *Jour. de Med., Chir. Pharm. &c.*, Paris, 1770, XXXIV, 283-7) reports the following case:

François Testu, of the parish of Bristy, in the diocese of Laon, robust and of a sanguine temperament was delivered of her first child. The labor was easy and normal. The lochial discharge began soon after delivery and was natural to all appearances. On the third day after labor the secretion of milk began and rapidly became abundant; it continued to increase in quantity, and there was great swelling of breasts, with inflammation extending to axillæ and down the sides; pain became intense. She could not move it was so great. The arms had to be suspended on account of swelling and pain. The breathing became labored and very painful. Notwithstanding her nursing the child, the milk flowed from the breasts in great abundance; the swelling was prodigious and the breasts were hard. A good woman of the immediate neighborhood advised her to apply to the affected parts potter's clay boiled in vinegar of wine. The

usage of this remedy for four days very much diminished the tension, volume and pain of the affected breasts. The breathing became much easier; fever continued with cold shiverings. These symptoms were out of proportion to the trouble in the breasts. The abdomen was meteoric accompanied by a great deal of pain in that region.

Bossu saw the case eight or nine days after the first application of the clay, and was told the milk secretion had entirely ceased. He attributed it to metastasis of milk to abdomen. He made resolvent and stimulating applications to the abdomen, and gave aperients and purgatives but no apparent change occurred within the next three or four days except abdomen grew larger. At the expiration of that time he punctured the abdomen and drew off about fifteen pounds of milk loaded with coagula, which obstructed the canula of the trocar. Milk returned to breast in sufficient quantity to nourish child and it was nursed from that time on. No reaccumulation in abdomen occurred.

DR. WINIWARTER.

The following case is reported in *Jahrbuch der Kinderheilkunde*, etc., vol. 11, Nos. 2 and 3, 1877, p. 196:

Jane L., daughter of a laborer who lives in rather poor circumstances, was born April 20, 1876, the seventh child of a feeble mother who, though she wore an aged look at an early period, was said to be healthy. The other children all died soon after birth or else in early infancy. Immediately after birth mother and nurse were struck by the unusually large abdomen of the child. A physician was called in and stated that the child would hardly live because it had a tumor in the abdominal cavity. Yet, in spite of her decrepit appearance, the child rallied, took the breast properly, and developed, although very slowly. The size of the abdomen, however, increased steadily, although, with the exception of a tendency to constipation, which had to be overcome by frequent injections, no real symptoms of disease were noticeable. It was only at the age of four months that the abdomen had obtained a size to interfere with respiration. The child vomited fre-

quently whenever she had nursed somewhat rapidly. The water injections failed, and senna was given repeatedly; yet the evacuations remained retarded and the intestines distended by gases, by which respiration was still more impeded. First seen in dispensary August 22, 1876; age, four months. Status: body feeble; muscles but little developed; face somewhat cyanotic; thorax in its lower circumference strongly expanded; abdomen exceedingly enlarged (65 centimeters in circumference), tense, drummy, but not quite symmetrical. In spite of the colossal expansion there is distinct, stronger bulging of the right hypochondrium, passing without sharply defined limits into the surrounding region. Palpation out of question on account of tension of abdominal walls. Percussion gave exquisite tympanitic sound over entire anterior region; decided dullness in lateral portions, changing its level when the child was placed upon one side or the other; the exact limits of the latter could not then be made out. Only this much for certain; that there must be free fluid in the cavity. The cause of this hydrops could not be demonstrated. Lower extremities not œdematous; no albuminuria. The pressing indication was paracentesis in order to relieve difficulty of breathing. An exploring trocar was passed into the left epigastrium at a perfectly dull spot, and after the removal of the stylet, to the surprise of all present there was evacuated in a large jet, a fluid looking exactly like milk. The resemblance was all that could be imagined—the same color, the same consistency, nay, even the same odor like fresh milk. Slowly (on account of the small canula) a quantity of about three liters was discharged. I then removed the trocar, before complete evacuation of the abdomen, in order not to lower pressure too suddenly.

Although the abdomen had become much smaller, yet the tympanitic intestines rendered examination difficult. There still was prominence of the right hypochondrium, and corresponding with it dullness extending from the hepatic dullness from about the middle edge of right lobe, and passing across the edge of the liver obliquely downward, where it merges into the dullness due to yet remaining fluid. It does not change its position in the upper por-

tion upon assumption of the lateral posture. At this place there is felt, upon deep palpation, a tumor composed of several somewhat movable portions, apparently attached to the spinal column behind, and in consistency corresponding to a flaccid cyst, or a conglomeration of such cysts. Fluctuation can not be shown with certainty. An exact definition from the anterior edge of the liver is possible; whether the tumor is connected with the lower surface of the liver can not be decided; it is not grown to the abdominal walls, and respiration does not displace it as a whole. No further revelations could be obtained. Above all, the milk-like fluid engaged our attention. It had a weakly saline taste; did not coagulate upon standing, but deposited a thick layer upon the surface, as milk deposits cream. The microscope showed no formation developments, with the exception of sparse cells, analogous to milk globules. The idea lying next was to regard this fat-emulsion, for such it was, as pure chyle, and this hypothesis was confirmed by the chemical analysis made by Prof. Ludwig with great exactness, the results of which I will present further on, as they were furnished by Prof. Ludwig. This fluid being looked upon as chyle, a question arose—how does it get into the abdominal cavity, and what is its connection with the palpable tumor?

Paracentesis had no local disturbing influence, and was followed by decided general improvement. The child began again to take food (she receives, besides the mother's milk, a little broth). Respiration became free; vomiting, constipation, &c., disappeared, but the fluid reaccumulated rapidly, necessitating a second tapping on September 12, 1876, by which, as well as by all those following it, the same fluid was evacuated to the amount of two or three liters at each operation. Tapping repeated November 18, December 19, and January 16, 1877. In the intervals the child sometimes suffered from diarrhœa, bronchitis, vomiting, &c., yet remained in a general fair condition of nutrition, though very slowly increased in size. Always felt worse before tapping. The latter always met an *indicatio vitalis*, because by the distension of the abdomen all reception of food was rendered impossible. After tapping rapid recuperation. Upon the last two occasions

I used (always in the left hypogastrium) a larger trocar and emptied the cavity nearly completely. We now were able to recognize the tumor and its composition by several soft, flaccid pieces. The point of region remained unsettled. February 12, 1877 (date of report), the child is still living in a condition entirely unchanged.

DR. MILLERET.

(Milleret: Jour. de Med. Chir. Pharm., &c., Paris, 1774, XLII, 231.)

Madame F.; 39 years of age; married about 12 years; no children. At different times she had suppression of the menses for several months followed by great loss of blood from uterus causing proportionate disturbance of the general system as marked by fever, flatulency, &c. Early in 1770 again had absence of the menses for a longer period than at any time before. Not believing herself pregnant, and hoping to free herself of the accumulation of blood which she believed to have accumulated in the uterine vessels, she took an unusual amount of exercise in the way of walking. This was followed April 13 by considerable loss of blood, and with it was expelled a well-formed dead female child of about four and a half months' gestation. This threw her into great consternation and she gave herself up to regrets, maintaining that she had sacrificed the life of her child. During several days she had considerable loss of blood but suddenly it stopped completely. The milk in breasts was abundant as evidenced by the extraordinary size of those organs and by its escaping freely from the nipples. It also ceased to flow at same time that the uterine hemorrhage ceased. Together with these phenomena there developed a fever of a violent type. No evacuations from breasts or from parturient tract could be re-established. The lower part of the abdomen now began to distend and within a month had enlarged considerably. This distension was thought to be vaporous tympanites as patient described it to me. Applications of different kinds to the abdomen were made and enemata of cold water given. This treatment was not successful and she grew weaker.

Toward the end of December following I again saw her, and on examination found the lower part of the abdomen very large and the umbilicus very prominent. I noticed an effusion of fluid in this region that proved to be ascitic.

But soon afterward the characteristic signs made me suspect that this was an effusion of milk. I explained to her parents the condition present and proposed paracentesis. She refused to allow the performance of the operation. I prescribed cordials, soups and such light and nourishing food. Soon after this I withdrew from the case but was again called January 17, 1771. The umbilicus had a few days previously acquired a much greater volume and was much inflamed. It had opened and there had escaped from the abdomen through the opening at different times, from 6 to 7 pints white matter of the consistency of clear bouillon. I saw on this occasion at least two pints of this fluid evacuated that very day. It had an acid taste like spoiled milk.

My first idea was to keep open the wound by prepared sponge. I injected a detergent fluid morning and evening to cleanse the intestines and prevent the evil effect that constant contact of the fluid might produce. These injections brought out whitish shreds that seemed to me to be decayed portions of the original fluid. The evacuation became less in quantity, purulent and of a fetid odor. A strong decoction of quinine and an equal quantity of wine of camphor was used for injecting into the wound. She was also given to drink four glasses of a decoction of calisaya bark and one clyster of the same each day. No change for next few days except increasing feebleness. She began coughing while dressing the wound and there appeared through the opening a portion of the small intestines. After giving her some warm wine I easily reduced it; quinine treatment continued. Judging from the abundance of membranous shreds that increased at each dressing of wound the omentum appeared to be entirely destroyed. After a few days the putrefaction appeared to cease on account of the antiseptic action of the quinine.

The character of the discharge was improving both as

to quality and quantity, but the intestines were too far mortified and perforated two days later near the umbilical opening. I noticed it at once by the escape of air and a great part of the bouillon. This accident deprived patient of the essential resources of life and very much aggravated her condition. I then resorted to enemata of bouillon, giving also by the mouth small quantities of it with alicante wine. The fever that had not disappeared now assumed the type of double tertian intermittent. The urine contained a considerable amount of white purulent matter. Six days after the intestinal perforation occurred there returned with the enema given membranous exfoliations having the color of burnt coffee. Some of them were a foot long, an inch in diameter and having fringed edges. The treatment was continued, and in spite of the abundance of the white matter there were noticed traces of excrements coming through wound, proving that communication had not been cut off and which gave me hope for my patient.

On February 10 there passed through the umbilical opening a very transparent gelatinous substance of about the size of a small worm, which I can best compare to apple-jelly and which I considered bouillon thickened by acids. No more of it ever appeared afterward. When removing the dressings earlier in the career of the case the most liquid part of the white fluid would spurt from the wound with a force depending upon the amount of contained material and running on the surrounding skin, producing a brown color of it. The room required free ventilation, as the odor was very bad. The abdomen now decreased in size, approaching normal; the pain, formerly severe, now much diminished; less matter escaped from the wound; more coming from the bowel naturally. A few days more there passed through wound but a small quantity of clear liquid a little chylous. The injections into wound now suspended, for fear they might interfere with healing of intestines and perfect closure of umbilical wound. This was February 18. I stopped treating patient, but through interest in case I occasionally saw the woman. The wound entirely healed and normal functions were re-established. I noticed some time after-

ward that lymphatic engorgement of the lower extremities was gradually going on. The infiltration having reached the lumbar region and finally the lower part of the abdomen, there was an accumulation of fluid from which the patient suffered up to August 13, 1771, when I was again called and found a real ascites, and decided to perform paracentesis. I evacuated six pints of water slightly citronized, soap-like and odorless, and the patient was much relieved. I prescribed a glass of wine each morning with infusion of senna. No reaccumulation occurred and patient entirely regained her health.

DR. MARTIN.

(Martin: Jour. de Med. Chir. Pharm., &c., Paris, 1770, XXXIV, 555.)

Patient was delivered May 8, 1769, of a dead child. At end of delivery had putrid miliary fever, with the eruption of which she was well covered. While convalescing from it she desired to take an "airing." The flow of milk was bountiful, divided between mammae and the intestinal canal, causing in the latter region painful tension, nausea &c.; small pulse. The lacteal excretion per anum did not excite my anxiety. On the contrary I regarded it as a good sign and, if her stomach had permitted me to give remedies, I would have tried to support this evacuation by giving light purgatives. But the irritation of the stomach was so great that such things were unbearable, and her hiccough led me to fear a great deal of inflammation. Such was the condition when I was called June 25, 1769. To calm this irritation I advised the patient to take chicken soup, small doses of Hoffman's anodyne, and some bland enema which previously she could never take. I also ordered a demi-bath or a full bath. Next night was far calmer than previous nights. It was considered best to prevent the secretion of milk and a few remedies ordered.

I lived some distance from the patient and returned home.

June 30 she wrote that the attacks were a little calmer but that her abdomen was much distended especially in the lower part. I wrote for a more careful description of

the appearance of the abdomen, and whether any undulation in its contour was noticeable, and stating that if such was the case there was no doubt that the milk had deposited itself there and nothing but puncture would relieve the condition. Two days later she replied that on close examination she found fluid was in the abdomen and requested me to come again and evacuate it. I punctured and removed two pints of fluid resembling whey. The lady now lives in Paris and is more particularly under my treatment. I made her take about twenty baths in order to get rid of the pain in stomach of which she complained so much at the beginning of the disease. No reaccumulation occurred and she is now entirely well.

DR. DONALD MONRO.

Dr. Donald Monro, in the third edition of his essay on *The Dropsy and its Different Species*, London, 1765, mentions (on page 22) the following case, taken from the *Memoirs de l'Acad. des Sciences*, 1700:

A girl having made too great an effort to raise a burthen, became hydropic soon after. Being frequently tapped, there always issued from the puncture chylous matter, in color, taste and consistence not unlike milk with a little salt in it, which being set on fire rarefied like milk and rose up in the vessel. It coagulated with salt of tartar but not with acids.

He also mentioned another case as being reported in the *Memoirs de l'Académie des Sciences*, 1710, and being similar.

DR. ED. SANDIFORT.

Dr. Ed. Sandifort, in his *Observationes Anatomico-Pathologicae*, Lugduni Batavorum, 1781, IV 1, p. 1, describes a case of effusion of milk in abdominal cavity and in other parts, in the corpse of a woman nine days after delivery of twins. The three previous deliveries were well recovered from but in the last pregnancy she had severe diarrhœa for the first seven months. During the seventh month she was delivered of twins. Soon after delivery the diarrhœa was unusually severe and she died on the ninth

day after delivery, having suffered with great pain in her sides just before death.

Autopsy.—A most beautiful body; the expansion of the hypogastrium was very remarkable; breasts seemed normal being no longer turgid with milk; in fact they contained hardly any milk; omentum highly inflamed and heavily loaded with fat; spleen and liver normal; caseous lacteal matter adhered to the peritoneum and to the small intestines; it filled the pelvis and greater part of the abdomen; of the color of milk; no smell and as to consistency it was like milk serum. The uterus was of the size and condition of ordinary cases at nine days after labor, except its interior was lined by a pseudo-membrane, as was the vagina, that was not detachable. He also refers to the following case in a foot-note. (Verhandl. van de Hollandsche Maatschappij der Westenschappen te Haarlem, VIII, D. 1st, page 386.) Woman died on sixth day after delivery and had lacteal metastasis to abdominal cavity. Three or four pounds of a thin whitish fluid not unlike serum of milk were found in the abdominal cavity by Van der Haar. The uterus was double the size of normal and the uterine sinuses were not yet closed.

DR. QUINCKE.

EXTRAVASATION OF CHYLE INTO THE ABDOMINAL CAVITY.

(Deutsches Archiv. f. Klinisch. Medicin., 1875, XVI, 128.)

Rosina W.; aged 30; small, spare, poorly developed and unmarried; had been feeble from childhood and often sick. Her urine was often greatly diminished and on one occasion, when in her twelfth year, no urine was voided for several days. In the period between her tenth and fifteenth year a firm œdematous swelling of the right fore arm and leg developed itself and continued up to time of her last illness. In the winter of 1873-'74 she suffered from bronchial and gastric catarrh, and toward spring a swelling of the abdomen made its appearance with a diminution of the renal secretion, which toward the end of April on one occasion, remained absent for three days. By the eighth of May the distension of

the abdomen having become enormous a puncture was made and ten liters of a milk-white liquid drawn off.

Effusion into the peritoneal cavity again took place with great rapidity so that early in June another operation was performed and again about ten liters of fluid evacuated, but less milky and turbid than the first. At this time both legs were firmly cedematous with the skin thickened and uneven; also edema of the abdominal integument. The left arm and face which were said to have been swollen were now natural. The quantity of urine was very small mostly only a cubic centimeter per day and rarely as much as 100 cubic centimeters.

No albumen present at any time. The swelling of the lower extremities increased from June. The skin finally gave way and a serum, at first clear but later yellowish, issued from the openings; but that of the upper extremities varied, and toward the end of the case was inconsiderable.

On the 26th of June a third operation again brought away a milk-like fluid like the first. There were six punctures in all. No fever present except such as complicated a bronchial catarrh. Death ensued September 5.

Character of the Fluid.—*First Operation.*—White, like milk; a thin cream-like layer formed on the surface upon standing; was odorless and of alkaline reaction. Under the microscope it presented the character of chyle; showed innumerable molecular bodies, and some lymph-corpuscles containing fat granules. By the addition of some drops of a solution of caustic soda shaken up in ether, the liquid became perfectly clear and yellowish, like an ordinary transudate. The ether upon evaporating deposited a fat of firm consistence. The liquid deprived of its fat proved very rich in its albumen; the filtrate reduced oxide of copper in an alkaline solution by boiling but not when cold; specific gravity of liquid, 1.017; quantity of fat, ether extract, 1.68 per cent.

Second Operation.—The liquid was more bluish and more translucent than the first.

Third Operation.—The liquid was more opaque than

that of the first operation and a little yellowish. It coagulated spontaneously and after deprivation of its albumen did not reduce oxide of copper even by boiling. In other respects even microscopically it comported itself like the first. The liquid of both the first and third operations did not become red on exposure to air; there was a striking indisposition to putrefy, though standing exposed in the laboratory to a summer temperature. At 40° C. it liquified completely; but that of first operation again solidified at 28° C., while that of the third only at 23° C.

Diagnosis.—Rupture of one or more chyle-vessels and extravasation of their contents into the abdominal cavity. As to the cause and precise seat of such rupture the history of the case affords no certain indication.

Autopsy.—By Prof. Langhans. Number of hours after death not given. Decomposition; abdominal organs greenish.

Thorax.—In right pleural cavity one liter of reddish, turbid fluid containing milk-white flakes some of which had adhered to pleura costalis; color of flakes due to a finely granular fat. In left pleural cavity $\frac{1}{2}$ liter of a blood-red fluid; no flakes.

Pleuræ.—No signs of inflammation.

Lungs.—Well filled with blood and slightly œdematous.

Heart.—Flaccid, fatty, moderately large and much decomposed. The left cavities contained well coagulated blood; right cavities, fluid, dark blood. Endocardium and valves normal.

Abdomen.—Much effusion, having the macroscopic and microscopic appearances of chyle, into the cavity. No coagula, but upon the lower portion of the ileum was found a fibrinous coating of moderate size. The serous membranes were clouded and thickened throughout, and presented many adhesions.

Small Intestines.—Lumen pretty large, the serous coat uniformly reddened, slightly clouded and adherent.

From an extent of 2 or 3 meters over the valvulæ coli an engorgement of the chyle vessels extended to the duodenum. The contained chyle was coagulated. Adjacent to the vessels were a number of roundish, slightly prominent milk-white specks of 2 to 3 millimeters in diameter, evidently the result of extravasation. They were coagula like that of the chyle vessels. This chylous substance was also upon the surface of the entire intestine and infiltrating both the mucous and submucous coats. In the latter were also accumulated masses of coagulated chyle 5 millimeters in diameter. The chyle vessels were engorged only to point of attachment of bowel to mesentery. In the mesentery they were not engorged. Mesenteric glands small and contained no chyle. The thoracic duct was normal; liver was large; acini contained fat globules; spleen large; kidneys small; suprarenal bodies soft; pancreas abnormally small and the stomach and large intestines presented nothing special.

DR. LORAIN.

MILKY ASCITES.

(Comp. Rend., etc., de la Société de Biol., V., 2d series, Paris, 1859, pp. 162, 166.)

A girl æt. 8, had been sick one year; vomited frequently, and was emaciated. The symptoms were analogous to those of tubercular peritonitis. The autopsy showed numerous tubercles in the lungs and a very large ascites. The proportion of albumen contained in the fluids was determined by three different experiments, as follows:

By coagulation.....	5.33
By the proportion of azote.....	5.07
By the difference of residue evaporation.....	5.58

In consequence of these analyses M. Lorain established the composition of the fluid as follows:

Water.....	92.25
Fatty matter { acid .. 0.61 }	1.84
{ non-saponifiable ... 1.23 }	
Albumen or analogous azotized matters.....	5.33
Salts, chlorides, sulphates, salts of lime.....	0.34
Loss.....	0.24

100.00

DR. HOPPE-SEYLER.

Hoppe-Seyler (Archiv. f. die Gesammte Physiologie des Menschen und der Thiere, VII, 407) refers to a case of "rupture of chylous vessels, caused by the pressure of a tumor, in which through a puncture several liters of a chylous fluid were obtained from the abdominal cavity, in which he found diastatic ferment in a very slight quantity; no pepsin, no albumen, digesting or fat-decomposing ferment."

DR. QUINCKE.

(Deutsch. Archiv. für Klinisch. Medicinisch., Leipzig, 1875, XVI, 121.)

Subject was a dissipated man, 50 years of age, who formerly enjoyed good health. While lying partly on right side and partly on his abdomen he was run over by a wagon breaking the 7th and 9th ribs of the right side in the axillary line. Pleuritic effusion rapidly appeared on that side and he was admitted to the hospital on that account 11 days after the injury. Twenty-one days after the accident occurred 1,800 cubic centimeters of a milky fluid were drawn from the pleural cavity. After the puncture the milky fluid came from the opening *guttatim* at the rate of 100 cubic centimeters per hour. Subsequently cedema of whole right side of body extending to right leg occurred radiating from seat of puncture. The fluid reaccumulated and the operation was twice repeated. It was during the last puncture that the man died. Prof. Langhans made the autopsy. He found the tissues of the right side of the body infiltrated with a fluid quite clear. The right pleural cavity contained 7,000 cubic centimeters of a yellowish, milky fluid. The pleura seemed to be healthy. Toward the mediastinum a few milk-white deposits easily removed; most copious upon the upper portion and at apex of pleural cavity. There was some white milky fluid found in the cellular tissue near junction of first rib with sternum, but it did not seem to be at all connected with the thoracic duct, which was full of coagulated blood between its mouth and the point of its emergence from behind the right subclavian vein.

Left pleural cavity contained about 100 cubic centimeters of nearly clear serous fluid. The sixth, seventh and eighth left ribs broken in axillary line. The right lung collapsed and compressed and bands of adhesion with chest-wall. Heart, liver and kidneys normal. In spleen small coagula of blood. Mesentery and intestinal mucosa without chyle. In pelvic cavity and between intestinal convolutions a small quantity of a whitish fluid. The fluid drawn from pleural cavity was found by microscopical and chemical analysis to be chyle.

Dr. WILHELM.

Wilhelm's case, as stated in *Correspondenz-blatt der Arztlichen Vereine der Rhein-provinz*, 1873-1875, No. 14, p. 23, is as follows:

"*Milky Ascites*.—A child six weeks old had a very severe attack of whooping cough, which lasted for two months. Two months after its cessation the parents noticed an enlargement of the abdomen, which continued to increase until the distension produced such dyspnoea that the attending physician gave up the case as hopeless. At the age of nine months (October, 1873) Wilhelm performed the operation of *paracentesis abdominis*, evacuating sixteen 'schoppen' of a milk-like fluid. After the evacuation of the fluid the abdominal organs were carefully examined, but nothing abnormal could be discovered except a tumor about the size of a hen's egg, situated in the umbilical region and firmly attached to the spinal column. The operation of paracentesis was repeated ten times in the succeeding seven months. Rindfliesch pronounced the fluid pure lymph, which entered the abdominal cavity from a ruptured thoracic duct. Wilhelm supposed the tumor to be an hypertrophied lymph-gland, fistulous, and in connection with the thoracic duct, through which the lymph was poured into the abdominal cavity."

Dr. F. WINCKEL.

Dr. F. Winckel's case of Chylous Ascites caused by parasites-haematozoa (*Deutsch Archiv. f. Klinisch, Med.*, Leipzig, 1876, XVII, 303-306):

"The widow of a missionary, aged 39 years, who had resided ten years in Surinam, observed a year after returning home (1872), increased tension of the abdominal walls and the protrusion of a tumor from the vulva. The vulvar tumor consisted of a cystocele and incomplete prolapsus uteri caused by the pressure of the chylous effusion in the peritoneal cavity. After a course of ineffectual medication which was assiduously prosecuted until September, 1874, she was tapped, and two liters of a buttermilk fluid was evacuated. Under the microscope this fluid exhibited an enormous number of small filiform entozoa, in very active serpentine and whipping motion, each with a rounded head, a sharply-pointed tail, and upon the head four or five cilia, by means of which they appeared to obtain nutriment from the surrounding parts.

In some was observed a central tube extending from the head to the tail. They were 0.01 millimeter in width and 0.2 millimeter in length.

After the tapping the patient recuperated, but soon there follows a swelling of the left leg similar to a *phlegmasia alba dolens*, and equally tense and painful. Urine was normal in color and specific gravity; did not contain any albumen. No tumor could be recognized in the abdominal cavity. The liver, kidneys and spleen seemed normal. No fever at any time, but the patient sometimes felt cool and presented moderate appearances of anæmia. The swelling in the leg gradually subsided, but a pain in the veins near the groin remained for some time. She continued in fair health until the summer of 1875, when there was a slight return of the ascites. From this time it continued to increase, and in August, 1876, she was again tapped, nineteen quarts of a similar fluid being evacuated; but the relief was only partial and two days afterward, during an attempt at defecation, she was suddenly seized with a violent pain in the abdomen and expired in great agony in thirty minutes. Previous to the last tapping the right pleural cavity showed exudation without previous pleuritic symptoms."

(Winckel refers to a statement made by the patient that physicians in Surinam characterized her case as

nothing unusual, and her relation of a case from which "two casks full" of a similar fluid were evacuated.)

DR. BERGERET.

Bergeret reports the following case of "Oily Ascites," in the *Jour. de l'Anat. et de Physiol.*, 1873, IX, 586-592, Paris:

M. P., a maiden 27 years old; menstruated at 20 and at 23 her menses ceased never to return. She was a patient as an incurable at La Charité because she was not able to care for herself. At the age of 13 she had typhoid fever, subsequent to which her lymphatic system was attacked. At the time of her admission she had "écrouelleux" discharges from the groins and arm-pits, and suppuration in the back. Under appropriate treatment the discharges ceased rapidly and the sores healed, but at the same time her belly became enlarged. On August 1, 1873, her abdomen was very large and increased so rapidly that respiration became seriously disturbed; cough ensued, and became very troublesome both day and night. There were softened tubercles at apices of both lungs. September 10 her abdomen was punctured and a milk-like fluid, with a light bluish tinge, was evacuated; specific gravity, 1.007; reaction neutral.

Under the microscope were seen fat drops varying in size; no other figured elements. On October 11 a second operation was performed; the same kind of fluid evacuated but the specific gravity being 1.740. Under the microscope it exhibited a serosity holding in solution granulations "*refringentes*," without any large drops of oil.

There was 16.70 grams fatty matter per liter; considerable albumen and chlorides; small amount sulphates, and a trace of phosphates.

DR. MORTON.

R. Morton, in his *Phthiseologia* (see Donald Monro: *The Dropsy and its Different Species*, 3d Ed., London, 1765, p. 23) gives an account of a case of Chylous Ascites in

a boy two years old which by an autopsy was found to have been occasioned by a number of large indurated tumors situated behind the trachea arteria which compressed the thoracic duct near the subclavian vein as much as if a ligature had been made upon it, and had been the cause of rupture of some of the lacteals.

DR. PERCIVAL.

(Essays Medical, Philosophic, and Experimental, London, 1788, I, p. 171.)

Dr. Percival reports a case communicated to him by Sir William Watson, and that occurred in the practice of Dr. Huxham:

A girl about 8 years old was tapped for ascites and even her face was very much bloated and very pale. Four quarts milky colored fluid, which would not coagulate by heat, were drawn off. This fluid after standing a day or two was covered by a thin cream, and in a few days more smelled and tasted sour. At a subsequent tapping a similar fluid somewhat more dilute was evacuated. The swelling of the abdomen subsided and she recovered her appetite and strength. Before she was attacked she was very lively and active and had a voracious appetite which she indulged. (Percival suggests that she probably ruptured some chyle duct by overexercise just after indulging her appetite.)

DR. F. S. VAN CAMP.

F. S. Van Camp reports a case as follows (*Observation d'une ascité; opération de la paracentèse; sortie d'un liquide d'un aspect laiteux; analyse par M. Michiels. Am. Soc. de Méd. de Anvers, 1842, III, 86-91*): "A government ship painter, aged 59, with lymphatic constitution, and affected for a long time with chronic bronchitis and ascites, in 1793 had two ribs fractured. From 1812 to 1816 had every morning an œdema of the lower extremities, disappearing slightly on moving about and not interfering with ordinary occupation. In 1824 was attacked with pleurisy which became chronic. The last affection

from which he suffered commenced with bronchitis. During the course of this affection a gouty affection of the feet appeared, but at the end of four days it migrated to the chest. The bronchitis became chronic. An expectoration of purulent phlegm, containing tuberculous concretions, increased from day to day. Respiration became difficult and attacks of asthma frequently occurred. Ascites complicated the bronchitis, and was caused by the interruption of the circulation in the lungs. In consequence of the imminent danger of suffocation the patient was tapped. The fluid rapidly accumulated in the abdominal cavity, and the operation was repeated a second and a third time, the patient dying three days after the last paracentesis."

"The quantity of liquid evacuated at each operation was about 12 liters. Its color was similar to that of milk. Left at rest in a large vase for several days it deposited large flakes of a white and slightly yellowish color."

"The fluid was opaque, frothy when shaken and presenting the aspect and consistency of milk rich with cream; an odor of rotten eggs; specific gravity 1.018, and reddened litmus paper. It contained albumen to the extent of 7.38 per cent.; fatty matter, 1.75 per cent.; sodium chloride, .65 per cent.; mucus, .25 per cent.; lactate of soda, .20 per cent.; and traces of sulphur. The clot was dirty white, slightly elastic, presented a fibrinous appearance, and was composed of water, coagulated albumen, fatty matter, chloride of sodium, lactate of soda and sulphur."

Dr. CAYLEY.

Cayley's case, although not a case of Chylous Ascites, is quite interesting in this connection inasmuch as the fluid was just behind the peritoneum.

It was reported in the Transactions of the Pathological Society of London, 1866, XVII, 163, and is as follows:

Obstructed thoracic duct; rupture of receptaculum chyli; peritonitis.

Charles S. 19 years old; a shopman; suffered a week from constipation and indigestion and had taken a good

deal of purgative medicine. Two days before admission he was attacked by severe abdominal pain and tenderness with vomiting. These symptoms were much relieved by opium, and enemata which caused the bowels to act. On admission there was some abdominal pain and tenderness. The patient lay on his back with his legs drawn up and during the night he was a little delirious. The next morning he was seized with vomiting, and brought up much yellowish matter of a somewhat purulent appearance, and then fell into a state of collapse and died in a few hours.

Autopsy.—Some turbid yellow fluid in peritoneal cavity; peritoneum has a coating of soft, yellowish lymph, and in front of the spine is bulged forward by the effusion of a large quantity of milk-looking fluid behind it. The effusion extended as far as the pelvic brim. The thoracic duct throughout its course was found immensely dilated; at its termination it was about the caliber of the little finger, and was distended by a milky fluid resembling that extravasated behind the peritoneum. The receptaculum chyli was much dilated and on its anterior surface was a small perforation about two inches in length. The lymphatic glands in the dorsal and lumbar regions were much enlarged and soft and appeared infiltrated with a milky fluid. This condition on the right side extended into the iliac region. At the junction of the thoracic duct with the subclavian vein the former suddenly became narrowed and its coating thickened. Just at its mouth a fibrinous granular vegetation was attached to the lining membrane of the vein, which almost completely obstructed the opening of the duct. The narrowed part of the duct was completely blocked by a firm, yellow, cylindrical coagulum. On removing this a very fine probe could just be passed from the duct into the vein. The body was moderately well nourished and the other organs were normal. On microscopic examination the milky contents of the dilated duct were found to consist of lymph corpuscles and a large number of cells which could not be distinguished from pus.

DR. G. O. REES.

ON CHYLE AND LYMPH.

(Dec. 18, 1840; London Med. Gaz., 1840-41, XLII, 547.)

He examined an ass shortly after feeding. The albuminous matter of chyle from thoracic duct, as estimated in this analysis, was of a dead-white color, which was probably owing to admixture with a substance of a peculiar character.

Separated as follows: Agitate chyle with ether, the mixture speedily separates into three layers, the lower a clear serous fluid, the upper a solution of fatty matter in ether. The middle portion is a pearly-white glairy substance, insoluble in ether and apparently owing its separation from chyle to abstraction of fats by ether as it does not separate from pure chyle from simply allowing it to remain at rest; at least not until decomposition occurs, when it falls to bottom and may be collected by decantation of supernatant serum.

EXAMINATION AND PROPERTIES OF THE WHITE SUBSTANCE.

Insoluble in hot and cold alcohol and in ether; soluble in liquor potassæ; miscible with water. When dried on platinum foil water added makes it pulpy. It is still miscible with water from which it, however, separates in flakes on adding diacetate of lead. These properties ally it to mucus, and from some comparative experiments it appears to resemble mucoid matter of saliva. This substance obtained from chyle gives out while drying exactly the same odor as saliva in drying. The milky white appearance of chyle (Dr. Rees believes) is due to large amount of this white principle, and not to fat alone, as stated by Tiedeman and Gmelin. Certainly the results of this chemical inquiry strongly corroborate Müller's observations.

SALIVA AND ETHER.

Three layers upper nearly pure ether and lower (same as chyle) of principal constituents of fluid. The middle

layer of an animal matter insoluble in ether and floating on surface of lower stratum of fluid. This layer he considers the same in saliva and in chyle—an animal constituent. He believes it assists taking nitrogen into blood.

THOMAS STEVENSON, M. D.

MILKY FLUIDS FROM ABDOMEN.

(Guy's Hosp. Reports, 1872, 3s, XVII, 231.)

First specimen (for Mr. Durham) April, 1860.)

Appearance decidedly milky, with faint tinge of color; no coagulum, and none formed on standing; specific gravity, 1.017.

Reaction faintly alkaline. After being freely acidulated with acetic acid a copious coagulum (by boiling) of yellowish color appeared. Fatty matter extracted by ether, 2 per cent.; solids (dried in water bath), 7.57 per cent.

Second specimen (for Dr. Moxon.)

Very much like Durham's; decidedly white and milky aspect. When putrefactive changes began it became greenish and the odor of decomposing pus set in; reaction, faintly alkaline; density, 1.009; highly albuminous and appeared to contain a trace of substance Scherer calls metalbumen; fat extracted by ether, a trace. In neither fluid was sugar or any normal constituent of urine found. Turbidity appeared to be due to very fine, suspended particles of albuminous matter not dissolved by ether, even when fluids had been treated by acids and alkalies.

To the cases cited by Busey¹ I have added the cases of Nickerson, Kien, Pelletier, Ballmann, Bossu, Milleret, Martin, Sandifort, Stevenson, and my own, making in all thirty cases.

A number of these cases were not originally reported as cases of chylous ascites. This may in part be accounted for by the modified condition of the effused fluid differ-

¹ New Orleans Med. and Surg. Jour., No. 3, 1876, to No. 8, 1878, Congenital Occlusion and Dilatation of Lymph Channels. New York: 1878. And Holmes's System of Surgery (Packard), vol. 11, p. 459.

ing in different cases. Dr. Stevenson examined fluid of cases for Durham and Moxon. No report of the cases were found.

Poncey concludes his case by expressing the opinion that the "complicated dropsy * * * was owing to obstructions both in the vessels and glands serving for filtration to the chyliferous duct, and to the glands and canals appointed for the distribution of the lymph over the whole body." (See Busey, Narrowing Occlusion and Dilatation of Lymph Channels, Acquired Forms, page 51.)

From a careful analysis of the foregoing cases the following conclusions have been drawn:

Hereditary tendency to lymphatic obstruction, as shown by elephantiasis occurring in several members of a family, the female sex, tropical climates, scrofula and syphilis, are possible predisposing causes of Chylous Ascites. It occurs at all ages, in various occupations, and is usually a complication of some abdominal tumor, or of those diseases causing enlargement of the abdominal lymphatic glands, adhesions, or inflammatory thickening of the intestine and mesentery—notably tuberculosis, peritonitis, and infectious fevers.

In the comparatively few cases in which it may be said to have occurred as a primary affection, it has been due to rupture of the thoracic duct, receptaculum chyli, or a lacteal, by traumatism or muscular exertion after a meal; or, as in one unique case, by obstruction of the thoracic duct by a "soapy mass," apparently analogous to a biliary calculus, or by the perforations of a parasite, probably the *filaria sanguinis hominis*.

The latter cause must be exceedingly rare in temperate climates, as in nearly every instance careful microscopical examination of the chylous fluid has been made, and the *filaria* found only in the one case, originating in Surinam.

It has been suggested that if the chyle escape by trans-

udation the quantity must be small, and would be re-absorbed by the peritoneum; and it has been found that tying the thoracic duct in animals was followed in a short time by rupture of the receptaculum chyli, with but slight effusion of lymph.

When this duct is tied however the occlusion is sudden and complete, and overdistension, sufficient to cause rupture, occurs before there is time for degenerative changes to take place in the walls of the vessels. But when the pressure comes gradually from a tumor the case is very different. Tension is maintained for a long time in the vessel of a degree not sufficient to cause rupture, because the occlusion is not complete, but still sufficient to interfere with the nutrition of the endothelial cells lining the ducts. Degenerative changes occur in these cells, as in all endothelial cells when subjected to this kind of pressure, and they are no longer able to perform their function and the chyle escapes. The process is similar to that which takes place in a vein under similar circumstances. The tying of a vein leads to little or no effusion of serum, while gradual compression frequently causes it. We would hardly expect to produce hydroperitoneum by ligating the vena porta; but we know that its most frequent cause is gradual compression of the portal veins in the liver. The walls of the chyle ducts, however, are very delicate; and while transudation must be an important factor in cases of Chylous Ascites, still rupture has certainly occurred in some cases of pressure from tumors, and it can not be said that ruptures of very small ducts may not have occurred even in all cases. Fortunately this is not a matter of practical importance.

An examination of the 27 appended cases, excluding two in which no details are given, shows 9 cases of obstruction of the thoracic duct, or of lacteals, in three of which there was also rupture; one case in which it is only stated

that tubercles were found in the lung and that the patient had symptoms of tubercular peritonitis; 3 cases in which tumors could be felt near the spine, and 3 cases in which there was probably temporary occlusion of some chyle duct from the pressure of inflammatory products, one of which complicated peritonitis, one putrid miliary fever, and one a very extensive inflammation of both breasts. In two of the 9 remaining cases there were enlarged glands, and in one the filaria were found. The other six, there is reason to believe, were cases of rupture, as in two of them, Murphy's and Nickerson's, the abdominal swelling was preceded by sudden pain after muscular exertion; the third patient, Percival's, was active and a voracious eater, and Percival's diagnosis was "rupture of a lacteal." Pelletier's patient had pain and milky vomiting and diarrhœa; Kien believed his case to be due to rupture; and in the sixth, Quinke's, the thoracic duct was found filled with clotted blood.

It will thus be seen that the immediate cause was obstruction of the thoracic duct, or of lacteals, with or without consequent rupture—in 9 cases, certainly, and probably in 18; rupture without obstruction in 6, and punctures of the filaria in one.

The primary lesion is rupture, perforation, or obstruction of a chyle duct, or both obstruction and rupture.

Obstruction may be caused, as in Rokitansky's case, by a deposit within the duct, probably analogous to gall-stone, or by vegetations in the subclavian vein at the opening of the thoracic duct, or, as is more common, by pressure from without of tumors, glands, fibrinous adhesions, or inflamed tissues. Adhesions are usually between loops of intestine or a loop of intestine and the mesentery, and are more apt to affect the lacteals as in one of Quinke's and in Ballmann's case.

These various forms of obstruction cause repletion and

distension of the ducts, alteration in their walls and transudation of chyle. The process is similar to the transudation of serum from distended veins; but, as the chyle ducts are of much more delicate structure, rupture frequently takes place, and indeed, it may occur in the lacteals as has been seen, simply from muscular exertion when the vessels are only normally distended after a meal.

When the thoracic duct is ruptured by crushing injuries, it may be found filled with blood, as in one of Quinke's cases, and fatty degeneration of the endothelial cells should be looked for in cases of compression.

In all cases the peritoneal cavity is more or less distended with a milky fluid, varying somewhat in appearance and chemical reaction, owing to varying amounts of serum, blood, pus, &c., with which the chyle is mixed, and also to differences of diet and digestive function of the patients. In one case the odor of ingested foods could be plainly distinguished. The peritoneum in cases of some months' duration is slightly thickened and opaque, and covered in places by whitish coagula deposited from the chylous fluid often in slender filaments. Displacements of abdominal viscera, compression of the lungs, &c., occur, as in all ascitic effusions, when the quantity of liquid is large.

When the *filaria sanguinis hominis* is the cause, these parasites will be found in great numbers in the chylous fluid, and their punctures may possibly be found in the duct with the microscope.

When a large rupture of the thoracic duct or receptaculum chyli occurs, the escape of lymph continues, and it is not probable that recovery ever takes place; but when a lacteal is ruptured, after the overdistension is relieved, the walls of the ruptured vessel contract, a coagulum forms from the chyle, and the flow is checked just as the flow

of blood is stopped in a ruptured artery. The walls of all chyle ducts, except the very small beginnings, are possessed of three coats, and are furnished with elastic and involuntary muscle fibers.

The symptoms in those uncomplicated cases due to rupture are comparatively well marked. The patient, usually after exertion, is suddenly seized with sharp, localized pain, followed by rapid swelling of the abdomen, suppression of urine, nausea, and vomiting, which in some cases is milky and accompanied by a milky diarrhœa.

There is no fever, unless as an accidental complication. Prostration is marked, and if the case lasts long enough rapid emaciation ensues. These cases usually recover after one or several tapplings. Cases due to occlusion occurring after recovery from peritonitis, or caused by the pressure of a benign tumor, vegetations in the subclavian vein, or a deposit in the thoracic duct, present a somewhat similar history, but are more chronic in their course. They are characterized by dull pain, swelling of the abdomen not so rapid, scanty urine, progressive prostration and emaciation, and occasionally by milky vomiting and diarrhœa. The latter symptoms may occur in any case, and, in conjunction with the signs of peritoneal effusion, are highly diagnostic of Chylous Ascites.

In the majority of cases, however, the symptoms are more or less obscured by those of the disease which it complicates; and the pain and swelling of the abdomen, from accumulation of fluid, occurring in the course of tuberculosis, cancer, peritonitis, or an infectious fever, may be the only points available for a diagnosis. In some of these cases however a tumor may be discovered in the abdomen, or there will be a history of tumor appreciable before the effusion occurred.

In well-marked cases a probable diagnosis may be easily made, especially should milky vomiting or diarrhœa occur.

It is only likely to be confounded with ordinary ascites, large cystic tumors of the abdomen, or distended bladder.

The differential diagnosis from ordinary ascites can not be made with certainty from the symptoms, but chylous fluid may be suspected when there is pain in the abdomen and loins, with rapid accumulation of fluid free in the peritoneal cavity, with an abdominal tumor, or recurring in the course of phthisis, cancer, peritonitis, or an infectious fever, without cirrhosis of the liver or other known cause of ordinary ascites. Cystic tumors may usually be distinguished by their slower growth, by the appreciation of a cyst wall, and by their beginning usually on one side.

One case was mistaken for distended bladder; but this can easily be distinguished in the majority of cases by the history and by introducing a catheter.

In all suspected cases, the diagnosis may easily be made certain by drawing off some of the fluid with a small aspirating needle and examining it microscopically; and this harmless proceeding should be resorted to in any case of doubt.

The prognosis in the majority of cases, from all causes, is unfavorable. Of twenty-two terminated cases, in which the result is known, fourteen ended in death and eight in recovery, while two cases were relieved, but not cured.

When irremovable tumors occlude the thoracic duct, or when there is a large rupture in this duct, or in the receptaculum chyli, recovery can not be expected. Relief may be afforded by aspirating, but the fluid will reaccumulate and continue to do so until the patient dies from exhaustion, the primary disease, or some intercurrent affection. Two patients however partially recovered one (Abell's) with two tumors pressing upon the lacteals, and one (Winiwarter's) with a somewhat movable congenital tumor, probably not causing complete and continuous occlusion.

The prognosis is unfavorable, of course, in cases complicating advanced phthisis, cancer, &c.; but in uncomplicated cases of rupture of a lacteal, permanent recovery may be expected, all cases in which this was the cause having regained their usual health.

The duration in fatal cases has been from seventeen days to three years, averaging thirteen months. In only four of those that recovered is the duration given: in one, two days; one, six years; one, four months; and one, a week.

Winckel's case of filaria regained her health after tapping, but had a relapse nine months afterward, was seized with a sudden pain in the act of defecation, and died in thirty minutes. No post mortem given.

The treatment in cases due to rupture of a chyle duct should be rest in bed, with light diet of such food as is digested and absorbed by the stomach, peptonized milk and beef tea, soft-boiled eggs, whipped raw eggs, &c., given in small quantities at short intervals, and a restricted quantity of water and other liquids, the object being to prevent distension of the lacteals and to favor contraction of the ruptured ends of the lacteal and the formation of a coagulum.

In chyluria one or two drachms daily of gallic acid has been found the most useful remedy, and it would be likely to do good in Chylous Ascites, especially when caused by filaria. Turpentine is recommended as a remedy for this parasite, and a decoction of mangrove bark (*Rhizophora racemosa*) is a popular remedy in British Guiana. (*Vide* Roberts on Urinary and Renal Diseases, Third Amer. Edition, 1879.)

The sulphate of quina, and other antiseptic remedies and ergot might be tried on theoretical grounds, and in all cases attention should of course be paid to the gen-

eral health, anæmia and emaciation combated with tonics, iron and other appropriate means.

The accumulation of fluid should be withdrawn by aspiration or with a small trocar whenever it begins to interfere with respiration or any of the vital functions, or when there is reason to think the chyle has ceased to escape, and this operation repeated as often as necessary. If the accumulation is very large, it may be well to draw off only a part at a time.

When the cause is a tumor, it should if possible be removed by a surgical operation, and in cases of doubt as to the nature and situation of the tumor an exploratory laparotomy would be justifiable, provided the patient's condition was such that restoration to fair health might reasonably be expected to follow removal of the ascitic affection.

If the tumor be clearly cancerous or the patient well advanced in phthisis, the treatment must be directed to the relief of symptoms and the support of strength. Nourishing food, such as is digested and absorbed by the stomach should be given and paracentesis resorted to when necessary.

Inunctions of cod-liver oil and baths of beef tea might serve to prolong life in some cases.

In conclusion, I must acknowledge my indebtedness to Dr. J. W. Bovee, senior assistant of the hospital, and Dr. W. P. Carr for valuable assistance in preparing this paper for publication.

